

A Comparative Study on the Effects of Vintage Nonpharmacological Techniques in Reducing Myopia (Bates eye exercise therapy vs. *Trataka Yoga Kriya*)

Abstract

Background: Human eye captures light rays as they come and fall on the retina and convert them into an image. However, in myopia, light rays fall in front of retina, causing blurring of image. Correction of this is generally done using correcting devices such as corrective glasses and contact lenses. Existence of some alternative therapies is also noticed in literature. **Aim:** To compare the effects of Bates eye exercises and *Trataka Yoga Kriya* on myopia. **Materials and Methodology:** Ethical clearance was obtained from the institution, and informed consent was taken from participants. In this randomized comparative study, 24 participants (48 eyes) were taken based on inclusion and exclusion criteria and were randomly divided into two groups: Group A and Group B, where Bates eye exercise therapy and *Trataka Yoga Kriya* were given, respectively, for 8 weeks. Participants were assessed for their refractive errors and visual acuity pre- and post-intervention. **Results:** Data were analyzed by SPSS version 20. Results obtained revealed that both Bates exercises and *Trataka Yoga Kriya* were not significantly effective in reducing refractive errors and in improving visual acuity (*P* value of refractive error in right eye: 0.4250; left eye: 0.4596; *P* value of visual acuity in right eye: 0.5691; left eye: 0.8952). **Conclusion:** This study concludes that nonpharmacological approaches such as eye exercises and *Trataka Yoga Kriya* are not significant on myopia.

Keywords: Bates eye exercises, myopia, short sightedness, *Trataka Yoga Kriya*

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Introduction

In myopia that is also called as short sightedness, there is a problem in the refraction of light, in which when the accommodation is at rest, the parallel rays of light from the space come to focus in front of retina.^[1] For the visual disability throughout the world, it is the common cause.^[2] About 69% of the general population in India has been reported to be affected with myopia.^[3] The prevailing treatment of refractive errors which are commonly used these days are glasses, contact lenses and refractive surgeries.

The thought of substitution of the prevailing modalities of treatments leads the thinkers to the nonpharmacological therapies such as “Bates eye exercise therapy” and some ancient techniques such as “*Trataka Yoga Kriya*.” Some ocular strengthening therapies are involved in Bates method, by which the ocular health can be maintained and promoted. However, this kind of therapy is yet underevaluated

by the modern sciences.^[2] The mainstream ophthalmologists rejected the Bates method during his generation and remains as same even today.^[4,5] Anyhow, it is seen that the eye exercises strengthen the eye muscles, and thus, diplopia and the point of convergence decrease. Meanwhile, *Trataka Yoga Kriya* of the ancient Indian tradition has been practiced throughout India and is strongly believed to increase the eye sight.^[6]

In the present research scenario, due to the lack of evidential studies over nonpharmacological treatment approaches in treating myopia, there is a need to study for different alternative approaches. This will help in extending the scope of physical therapy in modern medicine. Hence, the purpose of this study is to compare Bates exercises and Yoga in patients with myopia.

Objective

To evaluate the effects of Bates eye exercises and *Trataka Yoga Kriya* on

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myopia by comparing the changes in refractive errors and visual acuity.

Materials and Methods

A comparative study was conducted for 6 months on a sample size of 48 participants with myopia that was calculated using the G-power software. The inclusion criteria were an age group of 18–25 years, a refractive index ranging from -1.00 to -10.00 diopters, both genders, i.e., male and female, and myopia for the past 5 years, and the exclusion criteria were any lenticular or corneal opacity, other known ocular pathology, and infantile myopia. After receiving informed consent, participants were assessed by an ophthalmologist and the baseline values of outcomes were noted. The assessor was blinded and through simple randomization divided the participants into two groups with 24 participants and/or 48 eyes each. Participants were taken for a subjective and objective assessment before and after the treatment. The materials used in this study were Snellen's chart, lenses tray, autorefraction equipment, room temperature water, ice cold water, napkins, and candles. Intervention was given for 8 weeks; at the end of which, participants were assessed by the same ophthalmologist.

Procedure

In the Group A, the participants performed eye exercises for 8 weeks. The exercises given to this group were based on Bates technique; they were near to far shifting, palming, solarization, eye wash, eye squeezing, eye circles, and eye massage.

In the Group B, *Trataka Yoga Kriya* was performed by the participants for 8 weeks. The following activity was done by the participants of this group for 8 weeks. *Trataka* means steady gazing. It can be done on any external objects such as a candle, a leaf, a crystal, and a Shiva Linga. This included two steps; they were *Antaranga Trataka* and *Bahiranga Trataka*.

Results

The results of this study were analyzed using the SPSS software version 20, in which the means and standard deviation of the normally distributed data of the participants were calculated. The graphs with *P* values and *t*-values were plotted using the GraphPad InStat 3.10 by GraphPad Software.

There was no statistical significance in the postintervention *P* values of the data obtained for both the groups receiving Bates eye exercises and *Trataka Yoga Kriya*, in terms of refractive errors and visual equity of the participants with myopia. The results of the study are interpreted in the form of tables and graphs as follows.

Intragroup comparison of refractory errors and visual acuity

The Table 1 and 2 depicts the intra group comparison of refractive errors and visual acuity within the groups respectively.

Intergroup comparison of refractive errors and visual acuity

The two-tailed t-test has been incorporated to assess the *p*-values of post-intervention of refractive errors and visual acuity among both right and left eyes respectively.

Figure 1 depicts the *P* value (0.425) of postintervention for refractive errors in the right eyes for the Group A and Group B. Whereas, Figure 2 depicts the *P* value (0.459) of postintervention for refractive errors in the left eyes for the Group A and Group B respectively.

Figure 3 depicts the *P* value (0.656) of postintervention for visual acuity in the left eyes for the Group A and Group B. Whereas, Figure 4 depicts the *P* value (0.982) of postintervention for visual acuity in the right eyes for the Group A and Group B respectively. Although none of these *P* values are statistically significant.

Discussion

Myopia is a leading cause of loss of vision throughout the world, and its prevalence is increasing. The literature review shows that previous studies have stated that there is great effect of different eye exercises on refractive error.^[6,7] The reason behind the effect these eye exercises show is thought to be as it strengthens accommodation, which is the power of changing focus of eyes for vision. However, the basic concept behind *Trataka Yoga Kriya* is relaxation of mind and eye that in turn improves vision.

In this study, it was seen that there was a slight reduction in the myopia by performing the eye exercises. Hence, it

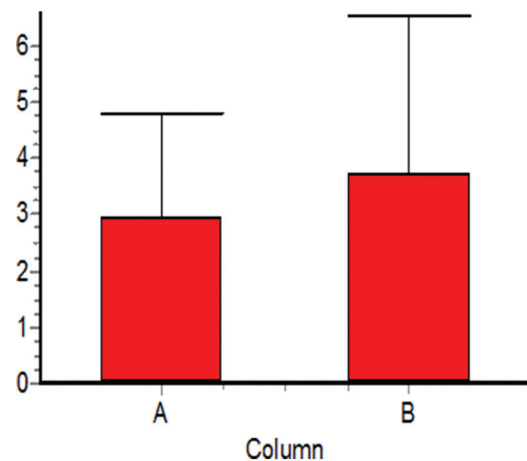


Figure 1: *P* value of postintervention in the right eyes of Group A and Group B (refractive errors)

Table 1: Refractive errors within the groups									
Refractive errors									
Group A					Group B				
Right eye		Left eye			Right eye		Left eye		
Preintervention	Postintervention	Preintervention	Postintervention		Preintervention	Postintervention	Preintervention	Postintervention	
Mean	3.16	2.938	2.917		3.792	3.792	3.750	3.604	
SD	1.920	1.865	1.961		2.870	2.870	2.493	2.483	
<i>t</i>	0.2696		0.2049		0.05389		0.1436		
<i>P</i>	0.7900		0.8395		0.9575		0.8871		
SD=Standard deviation									

Table 2: Visual acuity within the groups									
Visual acuity									
Group A					Group B				
Right eye		Left eye			Right eye		Left eye		
Preintervention	Postintervention	Preintervention	Postintervention		Preintervention	Postintervention	Preintervention	Postintervention	
Mean	35.500	32.500	30.500		36.667	36.667	32.667	29.667	
SD	13.160	12.124	6.987		21.831	21.831	21.563	20.500	
<i>t</i>	0.5808		0.8138		0		0.3493		
<i>P</i>	0.5673		0.4245		0.99		0.7302		
SD=Standard deviation									

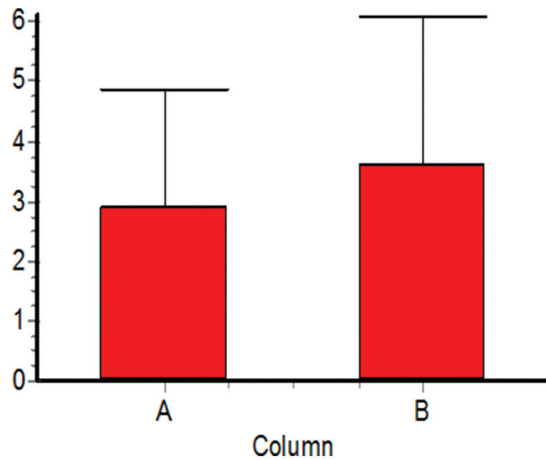


Figure 2: P value of postintervention in the left eyes of Group A and Group B (refractive errors)

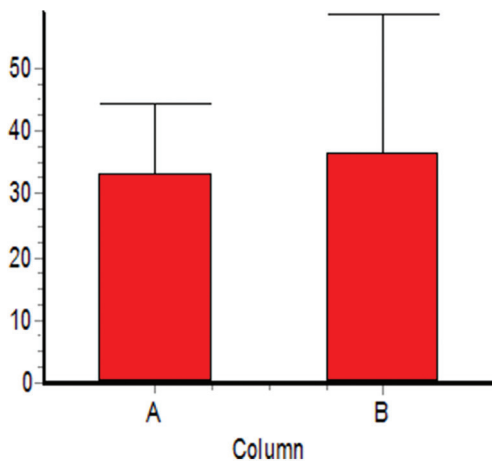


Figure 3: P value of postintervention in the left eyes of Group A and Group B (visual acuity)

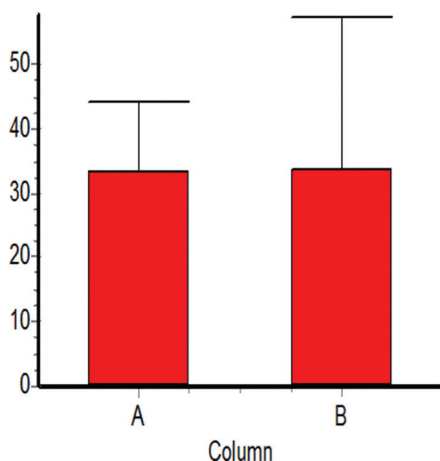


Figure 4: P value of postintervention in the right eyes of Group A and Group B (visual acuity)

states that Bates eye exercise has significant effect over the refractive errors over the participants involved in this study. However, due to lack of evidential studies over this,

Bates method and *Trataka Yoga* are not yet proved to have a significant effect in reducing myopia.

The participants in this study got a very minimal reduction of power. Therefore, it could be considered because of stress relief phenomena. Eventually, selection bias (the participants with range of refractive error were wide) and subjective assessment errors might also be some of the reasons. Certain variables were uncontrolled in this study, and their effect influenced the results was assumed to be null.

Whether or not the participants in the eye exercises group were actually doing the eye exercises in proper repetition and accuracy and the subjects in the *Trataka* group, how far were able to imagine the image of the candle flame in their inner vision. The lifestyle and dietary habits of the participants were assumed to have no effect on the muscle strengthening and improvement in the accommodation.

The future directions would be that the results in this study could be applied over the population diagnosed with myopia. This study did not include long-term intervention and follow-up period though exercises are effective for long-term benefits of interventions. There is a need for more research to be done to provide strong evidence whether Bates eye exercises and *Trataka Yoga* are effective for the reduction of myopia.

By observing the obtained results, the limitations would be lack of a larger sample size, short interventional protocol duration, the *Trataka* being tiresome for the participants to perform as they had to constantly gaze on the flame of the candle which could cause inconvenience for them; as the participants were students, they were asked to perform the exercises and the *Trataka* before and after the college hours, respectively. This caused inconvenience for the students to do the activities regularly.

Conclusion

This study concluded that both Bates eye exercises therapy and *Trataka Yoga Kriya* in reducing refractive errors in myopia were not effective. There was no significant improvement found postintervention in the refractive errors and visual acuity among both the groups.

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Conflicts of interest

There are no conflicts of interest.

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